

MRID No. 420553-21.

DATA EVALUATION RECORD

- 129099
1. **CHEMICAL:** NTN 33893
Shaughnessy No. ~~129059~~
 2. **TEST MATERIAL:** Technical NTN 33893, 95.9%.
 3. **STUDY TYPE:** 21-Day Chronic Renewal Toxicity Test,
Freshwater Invertebrates, Daphnia magna.
 4. **CITATION:** Young, B. and G. C. Blakemore. 1990. "21-Day
Chronic Static Renewal Toxicity of NTN 33893 to Daphnia
magna". Analytical Bio-Chemistry Laboratories, Inc. P.O.
Box 1097, Columbia, Missouri 65205. Laboratory Report No.
38346. Submitted by Mobay Corporation, Agricultural
Chemicals Division, P.O. Box 4913, Kansas City Missouri
64120. US EPA MRID No. 420553-21.
 5. **REVIEWED BY:**

Dana Lateulere, Biologist
Ecological Effects Branch
Environmental Fate and
Effects Division

Signature: *Dana Lateulere*
Date: *3/27/92*
 6. **APPROVED BY:**

Ann Stavola, Section Head, 5
Ecological Effects Branch
Environmental Fate and
Effects Division

Signature: *Ann Stavola*
Date: *3/27/92*
 7. **CONCLUSIONS:** This study is scientifically sound but does
not fulfill guideline requirements due to protocol
deviations; thus, it has been classified as supplemental.
The NOEC of NTN 33893 on Daphnia magna, based on growth
data, is 1.8 mg/L with a LOEC of 3.6 mg/L. The MATC,
derived by geometric mean, is 2.5 mg/L.
 8. **RECOMMENDATIONS:**
 9. **BACKGROUND:** This study was submitted as part of registration
and EUP requirements. *3/25/92*
see
 10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A. *none*

11. MATERIALS AND METHODS:

- A. Test Animals:** The Daphnia magna used in the test were from an in-house culture which has been maintained by ABC facilities since 1977. All daphnids were cultured and tested in a temperature controlled are at 20 +/- 2°C. The lighting was at an intensity of 40-80 footcandles on a 16 hour light, 8 hour dark photoperiod. A 30 minute dawn and dusk transition period was utilized. During the holding period, the daphnids were fed an algae, trout chow and yeast suspension. Only first-instar daphnids were selected for testing.
- B. Test System:** The study was conducted as a static renewal in one-liter glass jars containing 400 ml of solution. Four replicate jars were used for the control, solvent control and each treatment concentration. The dilution water used in this study was a hard blended water prepared to a total hardness of between 160-180 mg/L as CaCO₃. On study initiation, water hardness was at 140 mg/L however, this value was considered an outlier since hardness values for the previous and following days were at 160 mg/L. All test chambers were immersed in a thermostatically heated water bath adjusted to maintain the test concentrations at 20°C. Light intensity ranged from 51-53 footcandles at the water surface during the conduct of the study.
- A total of 24 daphnids were exposed to each test level by random assortment into quadruplet replications. The loading rate for each test level was one daphnid per 67 ml of dilution water. The exposure was begun on June 1, 1990 and all solutions were renewed every Monday, Wednesday and Friday throughout the study.
- The daphnids were fed an equal amount of algae at least twice daily. Daphnids in each test chamber were supplemented twice daily with a suspension of trout chow and yeast.
- C. Dosage:** Nominal concentrations were: 0, 0, 0.49, 0.94, 1.9, 3.8, and 7.5 mg/L. The mean measured concentrations resulting were: 0, 0, 0.46, 0.86, 1.8, 3.6 and 7.3 mg/L.
- D. Design:** Survival, abnormal effects and observance of first brood of the organisms were recorded daily

throughout the study. Reproductive success was measured by counting the offspring produced in each concentration every Monday, Wednesday, and Friday for the duration of the study. Separating neonates from adults was accomplished by gently removing adult daphnids from each chamber by means of a smooth glass pipet and transferring the daphnids to freshly prepared solution. Before the next renewal, the neonates were counted, recorded and discarded. Each chamber was cleaned and allowed to dry until needed for the next renewal.

Upon termination of the study on day 21 of exposure, the surviving adults were removed from the test chambers and isolated on a numbered glass slide. The length of each adult daphnid was measured and recorded.

On solution renewal days, water quality parameters of temperature, dissolved oxygen and pH were measured on newly prepared parent solutions. These same parameters were measured once each week on composites of alternation replicates of the solutions. Temperature of the water bath was recorded continuously with a thermal data logger.

E. Statistics: ANOVA, Fisher's Exact Test, Dunnett's Test and T-tests described by McClave, et al were utilized to statistically analyze the data.

12. **REPORTED RESULTS:** Statistical analysis of survival indicated a significant difference between the pooled controls and the mean measured concentration of 7.3 mg/L. The mean percent survival in the control, solvent control (DMF), and mean measured concentrations of .46, .86, 1.8, 3.6 and 7.3 mg/L were 100, 96 (+/-8.3), 95 (+/-10), 100, 100, 96 (+/-8.3) and 83 (+/-13.6)%, respectively. A 21 day EC50 based on immobilization, was calculated to be >7.3 mg/L. Immobilization was defined as the absence of movement with gently prodding.

Adult daphnid length was found to be significantly effected when compared to the pooled controls at the mean measured concentrations of 3.6 and 7.3 mg/L. The control and solvent control both had a mean daphnid length of 4.5 (+/- .10mm). All surviving daphnids appeared normal for the duration of the study.

Statistical analysis of time to first brood indicated no significant difference between the pooled controls and any of the test concentrations. Time to first brood for the control, solvent control and all test concentrations was 7

days. Young/adult reproduction days were significantly effected when compared with the pooled controls at the mean measured concentration of 7.3 mg/L. All young produced during the study appeared normal.

Ranges for the new solutions water quality parameters of temperature, dissolved oxygen and pH are as follows: 19-22°C at each renewal, 8.1 to 9.1 mg/L, and 8.1 to 8.5, respectively. The old solutions' temperature, dissolved oxygen and pH were: 20-21°C, 5.8 to 7.8 mg/L, and 7.9 to 8.5, respectively.

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:

Based on the statistical analysis of daphnid survival, reproduction and growth after a 21-day exposure to NTN-33839, the MATC limits were estimated to be the NTN-33839 mean measured concentrations of 1.8 and 3.6 mg/L. The point estimated MATC value was 2.5 mg/L.

Daphnid reproduction and percent survival were significantly affected by NTN-33893 at 7.3 mg/L. Adult daphnid length was significantly effected at 3,6 and 7.3 mg/L. A 21 day EC50 was estimated to be >7.3 mg/L.

Quality Assurance Inspection was conducted for compliance verification by the Quality Assurance Unit. It was also stated that this study was conducted in compliance with the Good Laboratory Practice Standards, 40 CFR Part 160.

14. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure: The test procedures were in accordance with Subdivision E, and SEP guidelines except for the following deviations:

- Dry weight measurements should be made of the adult daphnids at test termination; dry weights were not reported.

B. Statistical Analysis: Dunnett's test and Toxanol were utilized to determine the EC50, NOEC and LOEC.

C. Discussion/Results: The No-observed effect concentration (NOEC), Lowest-observed effect concentration (LOEC) and the geometric mean of the Maximum acceptable toxicant concentration (MATC) (which is the range between the NOEC and LOEC) were determined based on the data of survival, young produced per replicate, number of reproduction days per replicate,

young produced per adult reproduction day and length of adult mysids. The results (mg/L) are as follows:

	<u>SURVIVAL</u>	<u>YOUNG</u>	<u>REPRO DAYS</u>	<u>YOUNG/A.R.DAY</u>	<u>LENGTH</u>
NOEC	≥7.3	3.6	3.6	3.6	1.8
LOEC	>7.3	7.3	7.3	7.3	3.6
MATC GEOM. MEAN	n/a	5.1	5.1	5.1	2.5

NTN 33893, based on growth data, has a NOEC of 1.8 mg/L and a LOEC of 3.6 mg/L on Daphnia magna. The geometric mean of the MATC is 2.5 mg/L.

D. Adequacy of the Study:

- (1) **Classification:** Supplemental.
- (2) **Rationale:** See 14a.
- (3) **Repairability:** Yes, dry weight data may be submitted for upgrade of study.

TABLE 6

Percent Survival and Adult Length of *Daphnia magna* Continuously
Exposed to NTN-33893 for 21-Days During the Definitive Chronic Toxicity Study

Chamber I.D. (Nominal Conc.)	Mean Measured Conc. (mg/L)	Rep.	Day-21 Survival ^a				Day-21 Adult ^b Daphnid Length	
			Initial Number Instar	Adult Surv.	% Surv.	Mean ±S.D.	Mean Length mm	Mean ±S.D.
Control	N/A	A	6	6	100	100±0.0	4.46	4.5±0.10
		B	6	6	100		4.54	
		C	6	6	100		4.46	
		D	6	6	100		4.38	
Solvent Control	N/A	A	6	6	100	96±8.3	4.48	4.5±0.10
		B	6	6	100		4.52	
		C	6	5	83		4.47	
		D	6	6	100		4.49	
Pooled Controls ^c 4.5±0.10							98±5.9	
Level 1 (0.49 mg/L)	0.46	A	5 ^d	4	80	95±10.0	4.56	4.5±0.11
		B	6	6	100		4.43	
		C	6	6	100		4.53	
		D	6	6	100		4.52	
Level 2 (0.94 mg/L)	0.86	A	6	6	100	100±0.0	4.49	4.5±0.07
		B	6	6	100		4.45	
		C	6	6	100		4.43	
		D	6	6	100		4.48	
Level 3 (0.9 mg/L)	1.8	A	6	6	100	100±0.0	4.49	4.5±0.07
		B	6	6	100		4.47	
		C	6	6	100		4.48	
		D	6	6	100		4.44	
Level 4 (3.8 mg/L)	3.6	A	6	6	100	96±8.3	4.28	4.3±0.08*
		B	6	6	100		4.22	
		C	6	5	83		4.27	
		D	6	6	100		4.33	
Level 5 (7.5 mg/L)	7.3	A	6	6	100	83±13.6*	3.60	3.6±0.15*
		B	6	5	83		3.62	
		C	6	5	83		3.46	
		D	6	4	67		3.50	

* Denotes values significantly different ($P \leq 0.05$) from the pooled controls.

^a Data subjected to frequency analysis coupled with a one-tailed Fisher's exact test.

^b Data subjected to a one-way analysis of variance (ANOVA) and Dunnett's multiple means comparison test.

^c Control and solvent control were compared by one-tailed Fisher's exact test or t-test. If significantly different, comparison was made with solvent control otherwise controls were pooled.

^d One daphnid was accidentally killed during changeover transfer.

TABLE 7

Young/Adult Reproduction Days and Time to First Brood of *Daphnia magna* Continuously Exposed to NTN-33893 for 21-Days During the Definitive Chronic Toxicity Study

Chamber I.D. (Nominal Conc.)	Mean Measured Conc. (mg/L)	Rep.	Day-21 Reproduction ^a				Time to ^a First Brood	
			Total Young	Adult Reprod. Days	Young/ Adult Reprod. Days	Mean ±S.D.	Days	Mean ±S.D.
Control	N/A	A	1393	90	15.5	15.7±0.17	7	7.0±0.0
		B	1429	90	15.9		7	
		C	1406	90	15.6		7	
		D	1404	90	15.6		7	
Solvent Control	N/A	A	1413	90	15.7	15.1±0.75	7	7.0±0.0
		B	1336	90	14.8		7	
		C	1391	89	15.6		7	
		D	1273	90	14.1		7	
Pooled Controls ^b						15.4±0.60		7.0±0.0
Level 1 (0.49 mg/L)	0.46	A	1255	74	17.0	16.4±0.68	7	7.0±0.0
		B	1483	90	16.5		7	
		C	1486	90	16.5		7	
		D	1387	90	15.4		7	
Level 2 (0.94 mg/L)	0.86	A	1442	90	16.0	16.0±0.41	7	7.0±0.0
		B	1396	90	15.5		7	
		C	1437	90	16.0		7	
		D	1483	90	16.5		7	
Level 3 (1.9 mg/L)	1.8	A	1449	90	16.1	16.5±0.35	7	7.0±0.0
		B	1454	90	16.2		7	
		C	1502	90	16.7		7	
		D	1510	90	16.8		7	
Level 4 (3.8 mg/L)	3.6	A	1297	90	14.4	14.8±0.49	7	7.0±0.0
		B	1318	90	14.6		7	
		C	1381	89	15.5		7	
		D	1317	90	14.6		7	
Level 5 (7.5 mg/L)	7.3	A	744	90	8.3	7.7±0.65*	7	7.0±0.0
		B	683	83	8.2		7	
		C	531	76	7.0		7	
		D	577	79	7.3		7	

* Denotes values significantly different ($P \leq 0.05$) from the pooled control or pooled controls.

^a Data subjected to a one-way analysis of variance (ANOVA) and Dunnett's multiple means comparison test.

^b Control and solvent control were compared by t-test. If significantly different, comparison was made with solvent control, otherwise controls were pooled.

TABLE 8

Ranges for Water Quality Measurements During the NTN-33893 Chronic Toxicity Test with Daphnia magna

Chamber I. D. (Nominal Conc.)	New Solutions ^a			Old Solutions ^a		
	Temp. (°C) ^b	D.O. (mg/L) ^c	pH ^d	Temp. (°C) ^b	D.O. (mg/L) ^c	pH ^d
Control	19-21	8.1-9.1	8.2-8.5	20-21	6.1-6.8	8.0-8.2
Solvent Control	20-21	8.2-8.7	8.1-8.5	20-21	6.6-7.8	8.1-8.4
Level 1 (0.49 mg/L)	20-21	8.3-8.9	8.3-8.5	20-21	5.9-7.2	8.0-8.3
Level 2 (0.94 mg/L)	20-21	8.1-8.7	8.3-8.5	20-21	5.8-7.2	7.9-8.3
Level 3 (1.9 mg/L)	20-21	8.2-8.7	8.3-8.5	20-21	6.2-7.3	8.0-8.3
Level 4 (3.8 mg/L)	20-22	8.2-8.7	8.3-8.5	20-21	6.7-7.4	8.1-8.4
Level 5 (7.5 mg/L)	20-21	8.2-8.8	8.3-8.5	20-21	7.4-7.8	8.2-8.5

^a Water quality measurements for the new solutions were made on the parent stock solution at each renewal. Water quality measurements for the old solutions were made on composites of alternating replicates every week on Monday.

^b Temperature (°C) - Monitored using a digital thermometer. The water bath temperature was monitored continuously with a Rustrak® Ranger Data Logger, ABC Material #1905-1030 and ranged from 20-21°C.

^c Dissolved Oxygen Concentrations - YSI Model 54 ARC Dissolved Oxygen Meter, ABC Material #1905-485. Dissolved oxygen concentrations at the test temperatures of 19, 20, 21 and 22°C are 8.9, 8.7, 8.5 and 8.4 mg/L, respectively (corrected for altitudinal pressure at ABC Labs).

^d pH - Corning 140 pH/mV Meter, ABC Material #1714-175 and a Sorex Model S200C electrode.

Deanna

TITLE: NTN 33893 CHRONIC ~~MYSD~~ SURVIVAL 21 DAY
FILE: NTCHRSUR
TRANSFORM: NO TRANSFORM NUMBER OF GROUPS: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	0	1	6.0000	6.0000
1	0	2	6.0000	6.0000
1	0	3	5.0000	5.0000
1	0	4	6.0000	6.0000
2	0	1	6.0000	6.0000
2	0	2	6.0000	6.0000
2	0	3	6.0000	6.0000
2	0	4	6.0000	6.0000
3	.46	1	4.0000	4.0000
3	.46	2	6.0000	6.0000
3	.46	3	6.0000	6.0000
3	.46	4	6.0000	6.0000
4	.86	1	6.0000	6.0000
4	.86	2	6.0000	6.0000
4	.86	3	6.0000	6.0000
4	.86	4	6.0000	6.0000
5	1.8	1	6.0000	6.0000
5	1.8	2	6.0000	6.0000
5	1.8	3	6.0000	6.0000
5	1.8	4	6.0000	6.0000
6	3.6	1	6.0000	6.0000
6	3.6	2	6.0000	6.0000
6	3.6	3	5.0000	5.0000
6	3.6	4	6.0000	6.0000
7	7.3	1	6.0000	6.0000
7	7.3	2	5.0000	5.0000
7	7.3	3	5.0000	5.0000
7	7.3	4	4.0000	4.0000

Deanna

NTN 33893 CHRONIC ~~MYSD~~ SURVIVAL 21 DAY
File: NTCHRSUR Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	3.214	0.536	1.729
Within (Error)	21	6.500	0.310	
Total	27	9.714		

Critical F value = 2.57 (0.05,6,21)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

Daphnia

NTN 33893 CHRONIC ~~MYSID~~ SURVIVAL 21 DAY
 File: NTCHRSUR Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	0	5.750	5.750		
2	0	6.000	6.000	-0.635	
3	.46	5.500	5.500	0.635	
4	.86	6.000	6.000	-0.635	
5	1.8	6.000	6.000	-0.635	
6	3.6	5.750	5.750	0.000	
7	7.3	5.000	5.000	1.905	

Dunnett table value = 2.46 (1 Tailed Value, P=0.05, df=20,6)

Daphnia

NTN 33893 CHRONIC ~~MYSID~~ SURVIVAL 21 DAY
 File: NTCHRSUR Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	0	4			
2	0	4	0.969	16.8	-0.250
3	.46	4	0.969	16.8	0.250
4	.86	4	0.969	16.8	-0.250
5	1.8	4	0.969	16.8	-0.250
6	3.6	4	0.969	16.8	0.000
7	7.3	4	0.969	16.8	0.750

Daphnia

TITLE: NTN CHRONIC ~~MYSID~~ LENGTH DATA, ADULT
 FILE: NTNCHRLN
 TRANSFORM: NO TRANSFORM NUMBER OF GROUPS: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	0	1	4.4800	4.4800
1	0	2	4.5200	4.5200
1	0	3	4.4700	4.4700
1	0	4	4.4900	4.4900
2	0	1	4.4600	4.4600
2	0	2	4.5400	4.5400
2	0	3	4.4600	4.4600
2	0	4	4.3800	4.3800
3	.46	1	4.5600	4.5600
3	.46	2	4.4300	4.4300

3	.46	3	4.5300	4.5300
3	.46	4	4.5200	4.5200
4	.86	1	4.4900	4.4900
4	.86	2	4.4500	4.4500
4	.86	3	4.4300	4.4300
4	.86	4	4.4800	4.4800
5	1.8	1	4.4900	4.4900
5	1.8	2	4.4700	4.4700
5	1.8	3	4.4800	4.4800
5	1.8	4	4.4400	4.4400
6	3.6	1	4.2800	4.2800
6	3.6	2	4.2200	4.2200
6	3.6	3	4.2700	4.2700
6	3.6	4	4.3300	4.3300
7	7.3	1	3.6000	3.6000
7	7.3	2	3.6200	3.6200
7	7.3	3	3.4600	3.4600
7	7.3	4	3.5000	3.5000

Daphnia
 NTN CHRONIC MYSID LENGTH DATA, ADULT
 File: NTNCHRLN Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	2.920	0.487	243.500
Within (Error)	21	0.051	0.002	
Total	27	2.971		

Critical F value = 2.57 (0.05,6,21)
 Since F > Critical F REJECT Ho:All groups equal

Daphnia
 NTN CHRONIC MYSID LENGTH DATA, ADULT
 File: NTNCHRLN Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	0	4.490	4.490		
2	0	4.460	4.460	0.949	
3	.46	4.510	4.510	-0.632	
4	.86	4.463	4.463	0.870	
5	1.8	4.470	4.470	0.632	
6	3.6	4.275	4.275	6.799	*
7	7.3	3.545	3.545	29.884	*

Dunnett table value = 2.46 (1 Tailed Value, P=0.05, df=20,6)

Daphnia

NTN CHRONIC MYSID LENGTH DATA, ADULT
 File: NTNCHRLN Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	0	4			
2	0	4	0.078	1.7	0.030
3	.46	4	0.078	1.7	-0.020
4	.86	4	0.078	1.7	0.027
5	1.8	4	0.078	1.7	0.020
6	3.6	4	0.078	1.7	0.215
7	7.3	4	0.078	1.7	0.945

Daphnia

TITLE: NTN 33893 CHRONIC MYSID YOUNG/ADULT REPRODAY

FILE: NTYUNDAY

TRANSFORM: NO TRANSFORM

NUMBER OF GROUPS: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	0	1	15.7000	15.7000
1	0	2	14.8000	14.8000
1	0	3	15.6000	15.6000
1	0	4	14.1000	14.1000
2	0	1	15.5000	15.5000
2	0	2	15.9000	15.9000
2	0	3	15.6000	15.6000
2	0	4	15.6000	15.6000
3	.46	1	17.0000	17.0000
3	.46	2	16.5000	16.5000
3	.46	3	16.5000	16.5000
3	.46	4	15.4000	15.4000
4	.86	1	16.0000	16.0000
4	.86	2	15.5000	15.5000
4	.86	3	16.0000	16.0000
4	.86	4	16.5000	16.5000
5	1.8	1	16.1000	16.1000
5	1.8	2	16.2000	16.2000
5	1.8	3	16.7000	16.7000
5	1.8	4	16.8000	16.8000
6	3.6	1	14.4000	14.4000
6	3.6	2	14.6000	14.6000
6	3.6	3	15.5000	15.5000
6	3.6	4	14.6000	14.6000
7	7.3	1	8.3000	8.3000
7	7.3	2	8.2000	8.2000
7	7.3	3	7.0000	7.0000
7	7.3	4	7.3000	7.3000

Daphnia

NTN 33893 CHRONIC MYSID YOUNG/ADULT REPRODAY

File: NTYUNDAY

Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	229.534	38.256	133.762
Within (Error)	21	6.008	0.286	
Total	27	235.541		

Critical F value = 2.57 (0.05,6,21)

Since $F > \text{Critical } F$ REJECT H_0 : All groups equal

NTN 33893 CHRONIC *Daphnia* MYSID YOUNG/ADULT REPRODAY
 File: NTYUNDAY Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	0	15.050	15.050		
2	0	15.650	15.650	-1.587	
3	.46	16.350	16.350	-3.438	
4	.86	16.000	16.000	-2.512	
5	1.8	16.450	16.450	-3.702	
6	3.6	14.775	14.775	0.727	
7	7.3	7.700	7.700	19.437	*

Dunnett table value = 2.46 (1 Tailed Value, P=0.05, df=20,6)

NTN 33893 CHRONIC *Daphnia* MYSID YOUNG/ADULT REPRODAY
 File: NTYUNDAY Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	0	4			
2	0	4	0.930	6.2	-0.600
3	.46	4	0.930	6.2	-1.300
4	.86	4	0.930	6.2	-0.950
5	1.8	4	0.930	6.2	-1.400
6	3.6	4	0.930	6.2	0.275
7	7.3	4	0.930	6.2	7.350

Dephnia

TITLE: NTN 33893 CHRONIC MYSID NUMBER YOUNG PER REPLICATE
FILE: NTNCHRYUNG
TRANSFORM: NO TRANSFORM NUMBER OF GROUPS: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	0	1	1413.0000	1413.0000
1	0	2	1336.0000	1336.0000
1	0	3	1391.0000	1391.0000
1	0	4	1273.0000	1273.0000
2	0	1	1393.0000	1393.0000
2	0	2	1429.0000	1429.0000
2	0	3	1406.0000	1406.0000
2	0	4	1404.0000	1404.0000
3	.46	1	1255.0000	1255.0000
3	.46	2	1483.0000	1483.0000
3	.46	3	1486.0000	1486.0000
3	.46	4	1387.0000	1387.0000
4	.86	1	1442.0000	1442.0000
4	.86	2	1396.0000	1396.0000
4	.86	3	1437.0000	1437.0000
4	.86	4	1483.0000	1483.0000
5	1.8	1	1449.0000	1449.0000
5	1.8	2	1454.0000	1454.0000
5	1.8	3	1502.0000	1502.0000
5	1.8	4	1510.0000	1510.0000
6	3.6	1	1297.0000	1297.0000
6	3.6	2	1318.0000	1318.0000
6	3.6	3	1381.0000	1381.0000
6	3.6	4	1317.0000	1317.0000
7	7.3	1	744.0000	744.0000
7	7.3	2	683.0000	683.0000
7	7.3	3	531.0000	531.0000
7	7.3	4	577.0000	577.0000

Dephnia
NTN 33893 CHRONIC MYSID NUMBER YOUNG PER REPLICATE
File: NTNCHRYUNG Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	2082848.214	347141.369	83.765
Within (Error)	21	87028.750	4144.226	
Total	27	2169876.964		

Critical F value = 2.57 (0.05,6,21)
Since $F > \text{Critical } F$ REJECT H_0 : All groups equal

NTN 33893 CHRONIC MYSID NUMBER YOUNG PER REPLICATE
 File: NTNCHRYUNG Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	0	1353.250	1353.250		
2	0	1408.000	1408.000	-1.203	
3	.46	1402.750	1402.750	-1.087	
4	.86	1439.500	1439.500	-1.895	
5	1.8	1478.750	1478.750	-2.757	
6	3.6	1328.250	1328.250	0.549	
7	7.3	633.750	633.750	15.806	*

Dunnett table value = 2.46 (1 Tailed Value, P=0.05, df=20,6)

NTN 33893 CHRONIC MYSID NUMBER YOUNG PER REPLICATE
 File: NTNCHRYUNG Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	0	4			
2	0	4	111.980	8.3	-54.750
3	.46	4	111.980	8.3	-49.500
4	.86	4	111.980	8.3	-86.250
5	1.8	4	111.980	8.3	-125.500
6	3.6	4	111.980	8.3	25.000
7	7.3	4	111.980	8.3	719.500

TITLE: NTN 33893 # REPRO DAYS

FILE: NTREPRODAY

TRANSFORM: NO TRANSFORM

NUMBER OF GROUPS: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE	
1		0	1	90.0000	90.0000
1		0	2	90.0000	90.0000
1		0	3	89.0000	89.0000
1		0	4	90.0000	90.0000
2		0	1	90.0000	90.0000
2		0	2	90.0000	90.0000
2		0	3	90.0000	90.0000
2		0	4	90.0000	90.0000
3	.46	1	74.0000	74.0000	
3	.46	2	90.0000	90.0000	
3	.46	3	90.0000	90.0000	
3	.46	4	90.0000	90.0000	
4	.86	1	90.0000	90.0000	
4	.86	2	90.0000	90.0000	
4	.86	3	90.0000	90.0000	
4	.86	4	90.0000	90.0000	
5	1.8	1	90.0000	90.0000	
5	1.8	2	90.0000	90.0000	
5	1.8	3	90.0000	90.0000	
5	1.8	4	90.0000	90.0000	
6	3.6	1	90.0000	90.0000	
6	3.6	2	90.0000	90.0000	
6	3.6	3	89.0000	89.0000	
6	3.6	4	90.0000	90.0000	
7	7.3	1	90.0000	90.0000	
7	7.3	2	83.0000	83.0000	
7	7.3	3	76.0000	76.0000	
7	7.3	4	79.0000	79.0000	

NTN 33893 # REPRO DAYS

File: NTREPRODAY

Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	231.214	38.536	2.666
Within (Error)	21	303.500	14.452	
Total	27	534.714		

Critical F value = 2.57 (0.05,6,21)

Since F > Critical F REJECT Ho:All groups equal

NTN 33893 # REPRO DAYS

File: NTREPRODAY

Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	0	89.750	89.750		
2	0	90.000	90.000	-0.093	
3	.46	86.000	86.000	1.395	
4	.86	90.000	90.000	-0.093	
5	1.8	90.000	90.000	-0.093	
6	3.6	89.750	89.750	0.000	
7	7.3	82.000	82.000	2.883	*

Dunnett table value = 2.46 (1 Tailed Value, P=0.05, df=20,6)

NTN 33893 # REPRO DAYS

File: NTREPRODAY

Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	0	4			
2	0	4	6.613	7.4	-0.250
3	.46	4	6.613	7.4	3.750
4	.86	4	6.613	7.4	-0.250
5	1.8	4	6.613	7.4	-0.250
6	3.6	4	6.613	7.4	0.000
7	7.3	4	6.613	7.4	7.750

LATEULERE NTN 33893 *Daphnia* MYSID CHRONIC

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
7.3	24	4	16.66667	7.719398E-02
3.6	24	1	4.166667	1.490116E-04
1.8	24	0	0	5.960466E-06
.86	24	0	0	5.960466E-06
.46	24	2	8.333334	.0017941

THE BINOMIAL TEST SHOWS THAT 7.3 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 0

THE MOVING AVERAGE METHOD CANNOT BE USED WITH THIS DATA SET BECAUSE NO SPAN WHICH PRODUCES MOVING AVERAGE ANGLES THAT BRACKET 45 DEGREES ALSO USES TWO PERCENT DEAD BETWEEN 0 AND 100 PERCENT.

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
5	2.430418	1

GOODNESS OF FIT PROBABILITY
7.338148E-02

SLOPE = .5706513
95 PERCENT CONFIDENCE LIMITS = -.3189826 AND 1.460285

LC50 = 1217.714
95 PERCENT CONFIDENCE LIMITS = 24.63099 AND +INFINITY

LC10 = 7.24466
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY
